SOIL SURVEY OF FRANKLIN COUNTY, TEXAS.

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DESCRIPTION OF THE AREA.

Franklin County lies in the northeastern part of the State of Texas, in the second tier of counties from the Oklahoma line, being separated from Oklahoma by Red River County, and is the fourth county from the Arkansas line. It is bounded on the north by Sulphur River, on the east by Titus and Camp counties, on the south by Wood, and on the west by Hopkins County. It is included between

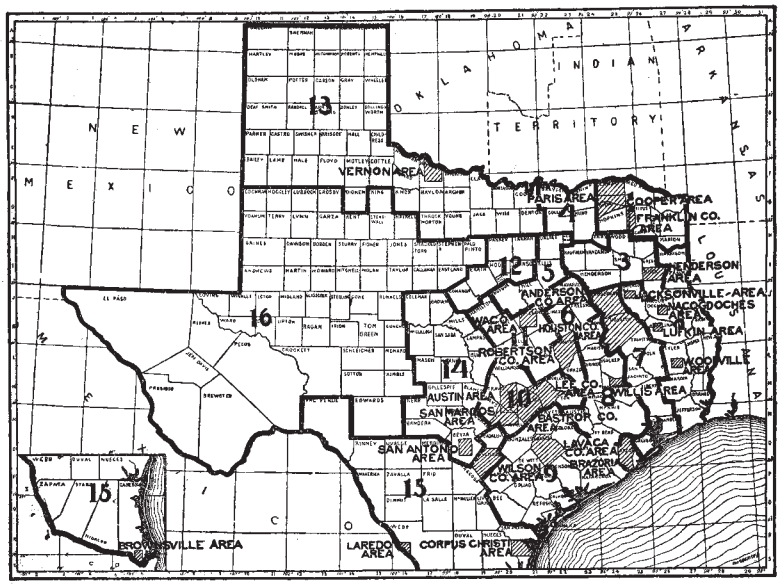

FIG. 24.—Sketch map showing location of the Franklin County area, Texas.

the meridians 95° 6′ 30″ and 95° 16′ west longitude and the parallels 32° 57′ 24″ and 32° 22′ 26″ north latitude. It is one of the smaller counties in the State, containing only 186,944 acres, or about 292 square miles. Geographically the county occupies a position between two natural divisions of the State. To the west occurs the broad treeless region of Central Texas, with its characteristic level or gently rolling topography, while to the east is found the more

broken eroded district of East Texas. Each of these divisions is represented in the county, but the prairie region, which occurs mainly in the northern part, occupies only about 15 per cent of the total area. Here the topography is quite level, and the few streams flowing through the section have comparatively shallow channels. The drainage is good, the principal stream in this region being the Sulphur River, which bounds the county on the north. This stream has its source in the Grand Prairie belt to the west and for several miles flows through black calcareous clays. During times of flood a large quantity of this fine material has been brought down and deposited over a broad, level flood plain, forming a soil of unusual strength and productivity.

The topography of the southern half of the county is considerably more broken than is that of the northern half, a condition due largely to erosion. In general, however, the surface features of the county are somewhat less broken than is usually the case in other East Texas counties.

By reference to the accompanying map it will be seen that two prominent divides separate the drainage systems of the county. One of these, between Sulphur River and White Oak Creek, passes from east to west across the northern part of the county, including the locations of Hagansport and Lavada. The second and more noticeable divide, separating the drainage systems of White Oak and Cypress creeks, passes through the town of Purley and thence north and east beyond the limits of the county.

The drainage systems of the area are well established, several streams having attained considerable size before entering the county from the west. White Oak Creek, the largest of these, has its source near Sulphur Springs, and after traversing the width of the county enters Sulphur River about 30 miles to the east. Entering White Oak Creek from the south are several lesser streams, of which Big Creek is the most important. This stream, rising in the vicinity of Purley, flows nearly north for about 10 miles, and with its numerous laterals from the east completely drains this part of the county. Beyond the divide to the east and south the county is drained by Cypress and Brushy creeks, the former of which has four important tributaries entering from the north—namely, Panther, Broughams, Andys, and Smiths. Brushy Creek, which forms a part of the east county line, has several important branches entering from the west, among the largest of which is Dry Cypress Creek.

The area now included in the county received its first permanent settlers about the year 1836. These came from Tennessee, and for more than thirty years the immigrants to the county were natives of that State. In 1870 immigration began to come in from Georgia

and Alabama, and five years later the county was organized. Settlement, however, was slow until 1887, when the completion of the railroad across the county encouraged development. The county is still but sparsely settled. In a total of 118,528 acres included in farms, according to the Twelfth Census, only 59,841 are under cultivation.

Mount Vernon, the county seat, is the largest town in the area. Winnsboro, on the southern line, has a population of about 900 and is an important shipping point for the southern part of the county. Another shipping point is Winfield, which is situated just across the line in Titus County, on the St. Louis Southwestern Railroad. Other small centers in the northern part of the county are Daphne, Lavada, and Hagansport. In this part of the county development is seriously hindered by the absence of adequate shipping facilities. The St. Louis Southwestern Railroad, crossing the central part of the county in an east and west direction, connects the area with St. Louis and the principal cities of the north and with Dallas and Fort Worth on the west. The latter point is an important one because of the active demand for live stock at that place. The Missouri, Kansas and Texas Railroad, touching the southern end of the county near Winnsboro, provides transportation facilities for that place and vicinity.

CLIMATE.

The climate of Franklin County is mild and agreeable. The summers are long, but the heat is usually tempered by the cool breezes from the Gulf.

During the period from 1894 to 1903, according to the records of the Weather Bureau station at Paris, the average number of days on which the temperature exceeded 100° was 17, varying from none in 1895 to 37 in 1899.

The winters as a rule are moderate, but are occasionally marked by sudden falls of temperature, due to "northers," or sudden cold waves from the North. These periods, however, are rarely more than two or three days in length and are not frequent. Plowing can be done during any month of the year and the growing season is such that at least two plantings of most crops can be matured between the opening of spring and the first killing frost of fall.

The following table, compiled from the records of the Weather Bureau station at Paris, gives the normal monthly and annual temperature and precipitation, etc.

Normal monthly and annual temperature and precipitation, etc.

Month.	Temperature.			Precipitation.			
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.	Snow, average depth.
	°F.	°F.	°F.	*Inches.*	*Inches.*	*Inches.*	*Inches.*
January	45	83	8	2.1	3.1	0.4	1.8
February	44	84	−13	2.0	.3	2.2	1.4
March	55	92	18	3.5	.6	4.0	0
April	65	96	29	2.9	3.2	4.7	0
May	71	96	38	4.5	2.4	4.3	0
June	78	104	46	3.3	1.2	2.0	0
July	83	108	60	3.1	1.5	4.6	0
August	82	110	57	2.0	Trace.	.1	0
September	76	106	42	2.8	.6	6.7	0
October	66	95	33	2.3	3.0	3.8	0
November	54	85	18	2.7	.6	11.9	0
December	46	80	5	2.1	1.9	3.4	.5
Year	64	110	−13	33.3	18.4	48.1	3.7

Average date of latest killing frost in spring, March 28, and of the first in fall, November 15.

Date of latest killing frost in spring, April 12, and of earliest in fall, November 3.

From this it will be seen the coldest month is February, and the hottest months are June, July, August, and September, for the last four of which occasional temperatures above 100° are usually recorded.

As a rule the rainfall is ample and well distributed, although dry years occur, when considerable loss is occasioned through insufficient cultivation and failure to conserve soil moisture. The average yearly rainfall at Paris is 33.3 inches, of which 10.9, or nearly one-third, occurs during May, June, and July. The total precipitation for the wettest year is 48.1 inches, and for the driest year 18.4 inches. Of this precipitation 3.1 inches are recorded for the growing months of June, July, and August.

The average date of the last killing frost in the spring is March 28, and of the first in the fall November 15, giving an average growing season of 232 days. The latest recorded date of a killing frost in spring is April 12, and of the earliest in the fall November 3.

AGRICULTURE.

From the settlement of the county in 1836 agriculture has been the dominant industry. Until after the civil war subsistence crops such as wheat, corn, potatoes, and vegetables only were grown. This was due to the fact that the nearest market for salable products was at Jefferson, 65 miles away, and cotton was in very little demand. The

methods in use during these early years were necessarily crude. No effort was made to cultivate the prairie soils, settlement being mainly on the sandy lands near the edge of the timber belt. The prairies, however, were highly valued as ranges for stock, and for many years the early settlers derived their sole income from this source. At the close of the civil war the methods of agriculture began to change. New settlers came in from Alabama and Georgia and took up the sandy lands in the southern part of the county. At this time cotton was high and in a few years crowded out wheat entirely, notwithstanding the fact that cotton had to be marketed 65 miles away. About 1885 the growing of wheat was again attempted, but the practice soon died out, and in the year 1900, according to the records of the Twelfth Census, only 549 acres were grown, with an average yield of less than 10 bushels per acre. Since this date practically all of the wheat products used in the county have been imported.

In 1887 a great stimulus was given the agriculture of the county by the completion of the St. Louis Southwestern Railroad, by which the county was placed on a direct line with the most important markets of the North. During the next few years settlement was rapid, but for the last decade the increase in population has been slight. A decided improvement, however, has been made in the agricultural methods and conditions. The acreage of trucking crops has been largely increased, and in the vicinity of Winnsboro the peach industry has been widely extended. According to reliable farmers, 80,000 peach trees were planted near this town in 1905, in 1906 there were planted 180,000, and in 1907 150,000 more; so it is safe to estimate that at the present time there are at least a half million trees in this vicinity just coming into bearing. Young orchards are also being put out around Mount Vernon, and the prospects for financial success are encouraging. This activity shows an awakening to the agricultural possibilities of the county as a fruit district, for in 1900, according to the census, the total value of the orchard products was only $9,073. Vegetables have always held a prominent place in the acreage of cultivated crops, their total value in 1900 being $21,796. During the year 1907 it was estimated that 50 carloads of Rockyford cantaloupes were shipped from Winnsboro alone, besides considerable quantities of cabbage, etc. In the same section watermelons are beginning to be grown in a small way and give promise of being a success. The greatest efforts, however, have been devoted to the production of cotton and corn, of which 19,632 and 18,039 acres, respectively, were planted in 1900. From this acreage 7,058 bales of cotton and 318,730 bushels of corn were produced. During this year 2,044 acres of oats were planted, giving on an average a yield of about 20 bushels per acre. Notwithstanding the marked adapta-

tion of some of the lowland soils to the production of forage crops and grasses, little effort is made to utilize them for this purpose. Only 396 tons of tame grasses were produced in the county in 1900, and since that date this amount has probably not been much increased, although considerable quantities of feed stuffs are annually imported from the West. In 1900 the county produced 108 acres of alfalfa, but the acreage at the present time is probably much less. This condition is due in a large measure to the fact that the soils used were not those best adapted to the plant. The county possesses several soils which if properly drained and protected from standing water would be well adapted to alfalfa. These are the Houston clay, Wabash clay, Sanders clay loam, Wilson clay loam, and Wilson loam. Although the adaptability of the sandy meadow lands to the production of sugar cane is quite generally recognized throughout the county, few fields of more than one-half acre in extent are seen on any farm. As the yield ranges from 250 to 500 gallons of sirup per acre, which sells readily for 35 to 50 cents a gallon, it would seem that a greater effort should be made to produce the crop commercially.

During the last two years considerable attention has been given to the production of peanuts. The sandy soils in the vicinity of Winnsboro and Mount Vernon are well adapted to this crop and return yields of 45 to 95 bushels per acre. The average price of the nuts is about 95 cents per bushel, most of the crop being disposed of at Marshall and Terrell, where mills for the extraction of the oil have recently been located.

The rotation most commonly practiced throughout the county is little suited to the requirements of the soils. Cotton and corn, being the chief crops grown, follow themselves or each other in the rotation year after year. The commendable practice of planting cowpeas in the cornfields at the time of the last cultivation is becoming more common, but is not yet as general as it should be. Ridge cultivation is still employed on some of the soils, but it is being recognized that this method favors the loss of soil moisture and the practice is gradually giving way to level culture. Cotton seed has been used as a fertilizer for several years, but the use of commercial fertilizers dates back only a few years, as is shown by the fact that according to the Twelfth Census only $124 was expended for this purpose in 1900. Since then the county's expenditure for fertilizer has increased several thousand dollars.

As a rule the labor used throughout the county is cheap, but the efficiency is usually rather low. The average wage for day laborers is about 50 cents a day or from $10 to $15 per month and board. Although a few large tracts of land are held by individuals as forest, or for grazing, the average size of farms in the county is relatively small, being in 1900 only 77.9 acres. During that year the percentage of

farms operated by the owners was 44.1, but since that date many of the tenants have acquired title to lands and now operate their own farms. The rental paid is on the usual share plan, by which the tenant furnishes everything but the land and buildings and receives one-half the crops. When the tenant furnishes only the labor he is given one-third of the corn and one-fourth of the cotton. Until the development of the trucking industries within the last few years the value of lands in the county was very low. Most of the land can still be bought for $5 to $10 an acre, but in the vicinity of Mount Vernon, near Winnsboro, and in the heavy bottoms of Sulphur River, the value ranges from $15 to $30 an acre.

As is common throughout the most of the South, the greatest hindrance to the agricultural development is the continuance of the one-crop system. Cotton and corn are the chief crops grown, but a greater effort should be made to introduce a more diversified system which will include the growing of live stock, fruits, vegetables, and truck. While a few small herds of cattle are being grazed on the prairies, the number that is still being kept in the county is far below that which should be produced. Not only should a greater number of animals be kept, but there is an urgent need for the introduction of improved breeds of stock, and to this end it is imperative that the production of grasses and feed stuffs be first given additional attention.

SOILS.

From the standpoint of formation the soils of Franklin County fall naturally into two general divisions—the upland or sedimentary soils and the lowland or alluvial soils. The upland soils may again be broadly divided into seven general groups or series, while those of the lowlands, exclusive of Meadow, fall naturally into two. The upland series are what is known as the Susquehanna, Norfolk, Lufkin, Wilson, Caddo, and Orangeburg, all of which have been previously mapped in other Texas areas. The first four of these series are general in occurrence and are represented in the county by two or three types each, while the others are of limited extent and represented by but one type each.

Geologically the county occupies an intermediate position between the Eocene sands of the East Texas timber belt and the heavier Cretaceous deposits of the Grand Prairie region. About four-fifths of the county is occupied by the East Texas sands, from which are derived 11 of the 15 upland soils. West of these sands a narrow strip extends southward to the Colorado River and beyond, paralleling the eastern border of the Cretaceous prairie belt. This strip, which forms the northern part of Franklin County, is mainly level prairie, dotted here and there with small groves of scrub oak and

hickory. The soil materials consist chiefly of brown fine sands, overlying stiff laminated clays. These "basal clays," so called from their position as the lowermost beds of the Eocene, are usually gray or brown in color and in their lower depths are almost always stratified.

The lowlands, exclusive of Meadow, are made up, first, of the Sanders soils, or gray silt loams and clays of the central and southern parts of the county found along White Oak, Cypress, and Brushy creeks, and, second, of the Wabash or black, heavy soils brought down from the Grand Prairie region and deposited along the Sulphur River bottoms. These soils during various seasons of the year are all more or less subject to overflow and in their present condition are of relatively low agricultural value. The Wabash clay, however, is an exceptionally strong soil and if drained and protected from overflows would be one of the most valuable in the county.

The most widely distributed soil in the county is the Susquehanna fine sandy loam. This is practically identical with the type of the same name found in other East Texas areas.

Only a very little typical Norfolk fine sandy loam is found in Franklin County. The type is usually closely associated with one of the soils of the Susquehanna or a phase of the Caddo fine sandy loam and in places has points in common with each of these types.

The following table gives the names and areas of the several soil types, while the accompanying map shows their distribution over the county:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Susquehanna fine sandy loam	77,952	41.7	Wilson clay loam	3,200	1.7
Lufkin fine sandy loam	22,848	12.2	Lufkin silt loam	2,176	1.2
Norfolk fine sand	18,560	9.9	Sanders clay loam	1,664	.9
Wilson loam	14,848	7.9	Orangeburg sand	1,280	.7
Meadow	12,480	6.7	Houston clay	832	.5
Caddo fine sandy loam	9,408	5.0	Lufkin fine sand	832	.5
Wabash clay	6,336	3.4	Susquehanna clay	448	.3
Norfolk fine sandy loam	5,312	2.8	Total	186,944	
Sanders clay	4,928	2.6			
Sanders silt loam	3,840	2.0			

LUFKIN FINE SAND.

The soil of the Lufkin fine sand from 6 to 20 inches is a gray or brown fine sand overlying material of similar texture but of a somewhat lighter color. At 2 to 4 feet deep occurs a gray or mottled yellow and gray compact clay, which in the lower depths is usually stratified. The soil has a loose, porous structure and is easily worked.

On account of its limited extent, the type is of very little agricultural importance. Only three small bodies were seen in the northern

part of the county, the largest of which is situated about 1 mile northeast of Hagansport. Here it occupies a position 20 to 30 feet below the level of the adjacent prairie to the south and 10 to 15 feet above the Sulphur River bottoms. The topography of this body is that of low swells and hollows with a difference in elevation of 3 to 5 feet. In the northwest corner of the county the type is found at the base of low hills and occupies a gentle, uniform slope. The surface drainage is therefore good. Its formation is due in this instance to the deposition above the stratified clays of sandy materials washed from the higher lying Susquehanna soils.

About 75 per cent of this type was orginally covered with oaks and hickory, about one-half of which has been removed. The remainder of the type is prairie, much of which is still covered by the native wild grasses.

Where the type is properly drained it is early and adapted to a wide range of cultivated crops. The nearest market, however, is 12 to 16 miles away, so that little opportunity for the shipment of crops is given. Only a few acres of the type are under cultivation, these being devoted to cotton and corn. The yield of the former is from one-fifth to one-half bale per acre, with an average of about one-third bale. Corn yields on an average about 15 bushels per acre. The land is valued at $4 to $7 an acre.

The following table gives the results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Lufkin fine sand.

No.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18325	Soil	0.2	0.4	0.3	11.7	21.4	59.4	6.6
18326	Subsoil	.3	.5	.3	12.9	26.9	49.0	9.9

LUFKIN FINE SANDY LOAM.

The soil of the Lufkin fine sandy loam is a dark-gray or brown rather silty fine sand or fine sandy loam from 8 to 20 inches deep, with an average depth of about 1 foot. The subsoil is an impervious brown or gray stratified clay, the stratification becoming more pronounced as the depth increases. When dry, the soil is loose and friable and easily cultivated, but when wet becomes compact and cohesive, in which condition it is difficult to handle.

The type is found only in the northern half of the county and is confined mainly to the prairie region, which extends in two continuous strips in an east and west direction across the county. One of the largest and most important bodies is found just north of Mount Ver-

non, whence it extends eastward along White Oak Creek beyond the county limits. Another body occurs to the south of Sulphur River and includes Hagansport and Lavada.

In the northeastern part of the county a characteristic feature of the type is the presence of small mounds from 2 to 4 feet high and from 20 to 40 feet across. On these the material is a fine gray sand 3 feet or more in depth. These mounds are comparatively few in number and their aggregate area is very small.

In the eroded section the type differs somewhat from that occurring on the prairie in that the surface is nearly always a gray fine sand or fine sandy loam, the lighter color being due to the smaller quantity of organic matter incorporated with the soil. The subsoil is also lighter colored, consisting usually of gray or drab stratified clay. The principal bodies of this phase were found southwest of Hagansport and as narrow strips along the north side of White Oak Creek.

Except for a few gently rolling areas, the topography of the type is uniformly level and drainage frequently inadequate. This is especially true where the flat areas are of considerable extent for the heavy, impervious subsoil prevents the downward passage of water and the only means of removal is by evaporation.

The Lufkin fine sandy loam is a sedimentary soil derived from the weathering of old marine beds. As the soil occupies a position between the " Grand Prairie " region on the west and the East Texas timber belt, it is probable that, like the Wilson loam, it has been influenced in its formation by both the Upper Cretaceous and the lower Eocene.

About 10 per cent of the soil found in Franklin County was originally treeless and covered by a valuable growth of native prairie grass. The remainder is covered chiefly with post oak, but some red oak, blackjack, and hickory are also found.

The Lufkin fine sandy loam if well drained is adapted to the production of apples, peaches, pears, small fruits, and truck. Cotton and corn are the chief crops, the yield of the former under the same conditions being slightly better than that of the latter. Cotton yields from one-third to one-half bale and corn from 15 to 20 bushels per acre. In the northwestern part of the county a large part of this type is still used for grazing and the production of wild hay. Where cultivated, ridge cultivation is practiced and the plowing is very shallow.

The greatest needs of the soil are more thorough cultivation and a diversification of crops and a deeper plowing of the soil. The land is held at $5 to $15 an acre, depending on improvements and location.

The following table gives the average results of the mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Lufkin fine sandy loam.

No.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18056, 18327.....	Soil.....	0.7	1.2	0.3	28.2	15.9	48.7	6.7
18057, 18328.....	Subsoil	.2	.4	.3	19.6	11.9	43.9	23.2

LUFKIN SILT LOAM.

The soil of the Lufkin silt loam to a depth of 4 to 8 inches is a gray silt loam or silty fine sand with an average depth of about 6 inches. The subsoil is an impervious gray or mottled yellow and gray silty clay, which in the lower depths becomes distinctly stratified. In a few places limited bodies are covered with 1 to 3 inches of sharp, fine sand. These usually occupy slightly depressed positions adjoining bodies from which the surface material has been largely removed, in which case the underlying clay is covered by only a very thin layer of gray silty loam. On a part of the type small mounds of sand are found and near these the soil is a heavy fine sandy loam.

The type is of limited extent, occurring only in a few small bodies in the northwestern part of the county. The surface is flat and after heavy rains is more or less covered with water.

Over much of the type both the soil and subsoil are similar to the soil and subsoil of the Lufkin clay found in other East Texas areas, but owing to the depth of the silt loam covering the type has been classified here as Lufkin silt loam.

Because of poor drainage only a few acres of this soil are under cultivation, the rest being occupied by valuable forests of post oak with some red oak and hickory.

When well-drained, fair yields of the staple crops are secured, but the type at best is only moderately productive. The soil is well adapted to the growth of redtop, or herd's-grass (*Agrostis alba*), and if this plant is once established there is no doubt that it will prove of value either as a hay crop or as permanent pasture sod. In preparing for the seed the ground should be thoroughly pulverized, and if possible should receive a dressing of manure before the plowing is begun. The value of the Lufkin silt loam averages about $5 an acre.

The following table gives the results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Lufkin silt loam.

No.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18323	Soil	0.1	0.3	0.2	12.0	24.5	50.2	12.0
18324	Subsoil	.0	.1	.2	8.7	20.5	42.6	27.1

SUSQUEHANNA FINE SANDY LOAM.

The soil of the typical Susquehanna fine sandy loam to a depth of 4 to 10 inches is a gray fine sand resting on a light fine sandy loam of a yellowish gray color. At an average depth of about 12 inches a red or mottled yellow and red stiff waxy clay appears, which continues to a depth of 2 to 3 feet. Below this depth the subsoil is rarely uniform in color, but varies from mottled, waxy clay to heavy gray material, which bakes and cracks into cubical blocks on exposure to the sun.

The structure of the soil is loose and porous and cultivation is easy. On some of the higher elevations where the drainage is good the soil has the appearance of the Orangeburg fine sandy loam found in other east Texas areas. The surface 8 or 10 inches is a red fine sandy loam thickly strewn with iron sandstone gravel. The subsoil, however, unlike that of the Orangeburg type, is a heavy, red plastic clay.

The typical soil most commonly occurs in irregular discontinuous strips on the slopes of drainage ways, the largest areas lying on each side of White Oak Creek and in the vicinity of Mount Vernon, Purley, and Macon. The topography varies from fairly level to rolling or hilly. On the slopes drainage is usually adequate for agricultural purposes, but the compact structure of the impervious clay subsoil is such that the downward passage of water is very slow and where the soil is even moderately level the drainage is poor. In such areas the soil would be benefited by artificial drainage.

The typical Susquehanna fine sandy loam owes its formation largely to the weathering of marine beds of sandy clay, but it is probable that as the Eocene age advanced a thin stratum of sandy material was deposited above the more finely divided clays.

Notwithstanding this soil has the greatest cultivated acreage in the county, there is still a large percentage of it in its natural wooded state. The growth consists of red oak, post oak, black-jack oak, and hickory. Only rarely are pines found on this type.

This soil is only moderately productive, but responds readily to fertilization and intensive cultivation. For this reason it is adapted

to a wide range of cultivated crops. Peaches have been found to do well, but the soil is not considered quite so desirable for this fruit as some of the sandy types of the Orangeburg series. Apples and pears have been grown to some extent and have given satisfactory returns. It would seem that the acreage of the fruits could well be enlarged. The soil is also adapted to Irish potatoes, sweet potatoes, peanuts, cowpeas, and truck. Radishes should do well and where markets are easily reached should be a profitable crop. About 90 per cent of the area under cultivation is devoted to cotton and corn. Cotton yields from one-fourth to one-half bale per acre and corn from 12 to 20 bushels. When commercial fertilizers are used for cotton, a brand containing about 2.05 per cent of nitrogen, 8 per cent of phosphoric acid, and 1 per cent of potash is bought. From 200 to 400 pounds of this mixture are applied per acre.

There is a phase of the Susquehanna fine sandy loam which differs from the typical areas mainly in the greater depth of the surface material. The soil is a loose gray sand or light sandy loam of fine to medium texture with an average depth of about 2 feet. The depth, however, varies greatly, ranging from 15 inches to 3 feet. The subsoil is a red, waxy, impervious clay resting on a gray or mottled red and gray clay from 2 to 3 feet deep. In the lower depths the clay is almost gray, especially in the lower areas, where drainage is deficient. On account of the greater depth of the loose surface soil this phase is considered more easily cultivated than is much of the typical soil.

The deep phase of the Susquehanna fine sandy loam occurs in many small bodies widely distributed throughout the county, the most numerous of which are found in the vicinity of Mount Vernon. Its topographic features range from high level plateaus to gentle slopes. On the sloping areas the drainage is good, but the impervious subsoil retains the water on the level areas, making artificial drainage desirable.

The native vegetation consists of red oak, post oak, and hickory. On account of the ability of the heavy subsoil to retain moisture the soil rarely suffers from drought. For this reason it is well adapted to a wide variety of crops. Fruits do well, especially peaches, although few orchards of commercial size are now in bearing. Grapes have been grown to a small extent, and it would seem that the extension of the acreage could be profitably undertaken. The soil is also well adapted to the production of truck, as well as berries and small fruits. Cotton and corn are the chief crops, the yields being about the same as on the typical or main areas of the type.

Although ridge cultivation is still practiced to a great extent, it is slowly giving place to level breaking, a method which favors the retention of soil moisture during the growing season. The plowing,

however, is much too shallow and better results would be obtained if the ground were broken deeper in the spring and more frequent shallow cultivation given during the summer months.

The fertilizer most commonly used on this deep phase is cotton seed, from 10 to 30 bushels being applied per acre. This is applied chiefly to the cotton crop, little fertilizer being used for corn. When commercial fertilizer is used, from 200 to 400 pounds are applied.

The Susquehanna fine sandy loam is the most extensive soil type in Franklin County, although it occurs in no section in large continuous bodies. The value ranges from $7 to $15 an acre.

The following table gives the results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Susquehanna fine sandy loam.

No.	Description.	Organic matter.	Fine gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0 mm.
	Typical phase:	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*
18339	Soil		0.8	2.0	0.8	9.0	43.0	39.2	5.1
18340	Subsoil		.0	.3	.3	1.7	8.3	36.1	52.8
	Deep phase:								
18337	Soil		.1	.2	.4	60.3	10.1	26.5	3.1
18338	Subsoil		.2	.2	.1	36.7	20.0	17.5	26.2

SUSQUEHANNA CLAY.

The soil of the Susquehanna clay, to about 4 inches in depth, is a grayish-yellow fine sand or fine sandy loam. The subsoil is a red, sticky clay resting on a mottled red and gray sticky clay at an average depth of about 2 feet. When wet, this is very plastic and adhesive and a very refractory soil to work. Only three small bodies of the type were found in the county, the largest of which occurs about 1½ miles east of Majors.

The topography is level, and the surface drainage is fairly good. The soil is sedimentary in origin and was probably formed in the same manner as the Susquehanna fine sandy loam, except that in this case the coarse surface material has been more completely removed, leaving the heavy clay with a shallower covering.

The natural growth is post oak, hickory, and pine. What little of the type is under cultivation is devoted to cotton and corn, the yields of the former ranging from one-fourth to one-third bale and of the latter from 12 to 20 bushels per acre.

The soil is deficient in organic matter and is in need of the leguminous crops such as cowpeas, vetch, or lespedeza. These should be plowed under in the fall. The value of the land ranges from $4 to $6 an acre.

HOUSTON CLAY.

The soil of the Houston clay is a brown or yellowish-brown clay loam or clay with an average depth of about 4 inches. The subsoil is a brownish-yellow clay from 4 to 20 inches deep, below which the material is sometimes slightly mottled with gray. Where the soil is typically developed, yellowish-brown limestone fragments are found scattered on the surface and embedded in both soil and subsoil.

If cultivated when the content of moisture is favorable the type is not hard to work, but when wet the soil is sticky and plastic, and when dry becomes hard and compact.

The Houston clay is a soil of limited extent in Franklin County, being found only in two small bodies. The most typical of these occurs as a narrow strip immediately south of White Oak Creek bottoms. The other is found occupying a similar position in the northern part of the county south of Sulphur River.

The topography of the type varies from level to gently rolling, the strip south of White Oak Creek occupying the slope separating the prairie from the lowlands. The surface drainage is good.

The Houston clay in Franklin County is largely a residual soil derived from the weathering of calcareous deposits. The areas are treeless and were originally covered by native prairie grass. It is one of the best alfalfa soils in the county and with the present local demand for feed stuffs, this crop should prove one of the most remunerative that could be produced. The type is also adapted to Melilotus, which can not only be used for grazing but which is especially beneficial in its effects upon the land. Unless the soil has been cropped to cotton and corn for several years, it is well adapted to the production of these crops. Cotton yields from one-third to three-fourths of a bale per acre with an average of about one-half bale. The average yield of corn is about 25 bushels per acre.

Notwithstanding the excellent surface drainage of the type, the soil is given ridge cultivation with the result that early in the summer the soil dries out and crops suffer from drought. To lessen this trouble the land should be broken level and given frequent summer cultivations. With the exception of a small quantity of cotton seed applied to the cotton fields, very little fertilizer is used. For general farm crops this is one of the best soils in the county. The value ranges from $10 to $15 an acre.

The following table gives the results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Houston clay.

No.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18321	Soil	0.0	1.8	1.4	5.0	6.0	57.9	27.5
18322	Subsoil	.0	1.2	.5	1.5	3.4	49.0	43.5

NORFOLK FINE SAND.

The soil of the Norfolk fine sand, to a depth of about 6 inches, is a fine gray sand resting on gray or yellowish-gray fine sand 3 feet or more in depth. In its original state the first few inches is usually a little more loamy than the underlying sand, due to the slight accumulation of vegetable mold. With cultivation, however, this condition soon disappears and the plowed fields present a uniform gray appearance. The structure is very loose and porous, rendering it the most easily cultivated soil in the area.

This soil, which is not extensive, is confined to the southern half of the county, the largest areas occurring near Purley, south of Majors, and in the vicinity of Winnsboro. In some localities the texture of the soil varies considerably, being composed in places chiefly of fine sand and in others containing relatively large quantities of medium sand. The areas of medium sand, however, are all of small extent and so do not appear upon the map as a separate type. The most numerous bodies of medium sand occur scattered through the type in the southwest corner of the county to the north of Broughams Creek and in the vicinity of Majors.

The Norfolk fine sand is most commonly found on broad, plateau-like eminences and has, therefore, a fairly level topography. Few streams are found, but the open structure of the soil provides a ready avenue for the downward passage of water.

The Norfolk fine sand is a sedimentary soil formed by the weathering of marine beds of Eocene age.

In its native state the soil is covered by a growth of pine, sand jack, black-jack, post oak, and hickory.

On account of the rapidity with which the soil dries off in spring, the fields can frequently be plowed while other soils are still too wet for cultivation. This makes it one of the earliest soils in the county and especially adapts it to the production of early truck crops. Tomatoes, peanuts, cowpeas, and sweet potatoes should all do well, and in many cases their cultivation would undoubtedly prove more

profitable than cotton and corn. The type is also adapted to strawberries, raspberries, and other small fruits, though but little attention is given to their production. In the southern part of the county the Norfolk fine sand is used to a considerable extent for the production of peaches. Near Winnsboro several large orchards were seen which are just beginning to bear and in favorable years are returning their owners a handsome profit. The trees, however, on this type are of comparatively short life. Cantaloupes are also extensively grown and are proving to be a valuable crop.

The greatest acreage of the type is devoted to cotton and corn, the yields ranging from one-fourth to one-half bale and from 15 to 18 bushels per acre, respectively. Peanuts are also beginning to be grown to some extent, the yields ranging from 45 to 75 bushels per acre.

The chief need of the Norfolk fine sand is organic material, which in many of the fields has become noticeably deficient. This condition could best be remedied by the growing of green crops for pasturage during the winter months, to be turned under in the spring before the planting of the usual crops, or as catch crops after corn or cotton. For this purpose vetch is the best crop for winter and cowpeas for summer planting. Clover and peanuts might also be valuable.

About one-third of the Norfolk fine sand in Franklin County is cleared and under cultivation. The value ranges from $5 to $8 per acre for the wooded sections and from $7 to $30 per acre for the cultivated areas, the latter depending on the nearness to market and the state of improvements.

The following table gives the results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Norfolk fine sand.

No.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18329	Soil	0.0	0.2	0.2	77.5	10.4	9.2	3.1
18330	Subsoil	.0	.0	.8	76.2	7.0	9.5	7.2

NORFOLK FINE SANDY LOAM.

The soil of the Norfolk fine sandy loam from 10 to 18 inches in depth consists of a gray or yellowish-gray fine sand or fine sandy loam with an average depth of about 1 foot. The subsoil is a yellow or slightly mottled red and yellow sandy clay which grades into a mottled gray and yellow clay at 3 feet or more.

Where the soil has not been brought under cultivation the first few inches are usually of a light-brown color, due to the slight accumulation of humus in the surface. The humus, however, disappears after the first few years of cropping. Only very few small areas of the Norfolk fine sandy loam are found in Franklin County. These occur chiefly in the eastern and southeastern parts and occupy low, poorly drained positions around the heads of steams.

The origin of the type is sedimentary, but since its original deposition the surface material has been somewhat modified by an admixture of sands washed down from higher soils. Because of poor drainage the type is cold and late in spring, and in its present condition is not so well adapted to early truck crops as is the Norfolk fine sand. When drained and given thorough cultivation, it is a productive soil, easily worked, and rarely suffers from drought.

On the higher slopes it is well adapted to the growth of late truck, berries, and small fruits. Only a very small proportion of the soil is under cultivation, cotton and corn being the only crops grown. Cotton yields one-fourth to one-third bale and corn from 12 to 20 bushels per acre. On the poorly drained, uncultivated areas Bermuda grass thrives well and provides excellent pasturage. As the type is low in humus, it would be much improved by the turning under of green manures. For this purpose leguminous crops should be used, cowpeas, vetch, and the clovers being the most desirable. The land is valued at $5 to $7 an acre.

The following table gives the results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Norfolk fine sandy loam.

No.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18333	Soil	0.0	0.3	0.2	45.7	25.9	22.4	6.0
18334	Subsoil	.1	.3	.1	43.2	17.4	16.4	21.9

ORANGEBURG SAND.

The soil of the Orangeburg sand consists of a light-gray to reddish-gray sand of fine to medium texture. In depth the soil averages about 20 inches, but varies from 15 to 30 inches, being more shallow on the hillsides, where slight erosion has taken place. The subsoil is a red sandy clay, the sand content being of a fine grade. This sandy characteristic of the subsoil, peculiar to the types of the Orangeburg series, gives it a water-holding capacity and a drought-resisting power above that of the close-structured Susquehanna soils.

The Orangeburg sand is of very limited extent in Franklin County, aggregating only about 3 square miles. The largest area is found about 6 miles southeast of Mount Vernon. Other small bodies are found near the south county line on the Missouri, Kansas and Texas Railroad in the vicinity of Scroggins and Musgrove. The type of soil as found in the southern part of the county is considerably finer in texture than that found in the northern part. The topography is somewhat hilly, the body southeast of Mount Vernon occupying the highest elevation in the county. This position, together with the peculiar structure of the subsoil, insures both surface and underdrainage.

The soil is formed by the weathering of the Lafayette clays and is the only representative of this formation in the county. About three-fourths of it is forested with oaks and hickory, the remainder being under cultivation. The soil retains moisture well and usually suffers less from drought than the other sandy soils of the area. For this reason, where shipping facilities are at hand, it is well adapted to the production of early truck. Judging from the success attending the cultivation of peaches, tomatoes, radishes, etc., on this soil in other east Texas areas it would seem that these crops could be produced at a good profit in Franklin County. Cotton and corn are the main crops, the yields ranging from one-third to one-half bale and from 18 to 25 bushels per acre, respectively. The value of land of this type ranges from $7 to $10 an acre.

The following table gives the results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Orangeburg sand.

No.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18335	Soil	0.0	5.2	35.3	31.5	9.6	13.7	4.3
18336	Subsoil	.0	6.0	28.5	15.0	5.5	13.8	30.4

SANDERS CLAY LOAM.

The Sanders clay loam consists of about 12 inches of dark-brown clay loam resting on a gray or slightly yellow and gray silty clay. The soil contains a large amount of organic material and is usually loose and porous.

The type is of limited extent in Franklin County, only one small body being found about 4 miles north of Mount Vernon. This occurs as a narrow depression at the edge of the White Oak Creek bottoms. In its lowest part the soil is poorly drained and at rare intervals is

subject to overflow. Its formation is due in part to flood action and in part to the wash from the adjacent prairie soils.

Originally the type supported a valuable growth of white oak and gum, but most of this has been removed. For cotton and corn this is one of the most productive soils now under cultivation in the county. It is also a good grass land, and, if properly drained, should be adapted to alfalfa. At present the only crops produced are cotton and corn. The former yields from one-half to 1 bale per acre and the latter from 20 to 35 bushels, although as high as 50 bushels per acre have been secured. The value ranges from $10 to $15 per acre.

WABASH CLAY.

The soil of the Wabash clay is usually a dark-brown to jet black heavy, waxy clay with an average depth of about 12 inches. The subsoil, from 12 to 24 inches, varies from black to slightly mottled yellow and brown clay resting on a mottled brown, gray, and yellow material of the same texture. Small lime concretions are occasionally seen scattered over the surface, but aside from these very little grit is found in either soil or subsoil.

This is the heaviest soil in the county, and when wet is so sticky and tenacious that travel on the type is almost impossible. In dry weather the surface bakes and cracks so that the soil is very hard to cultivate except when in the proper moisture condition.

Only one body of Wabash clay is found in Franklin County. This occurs as a strip from 1 to 1½ miles wide in the Sulphur River bottoms which continues across the north end of the county. The soil is subject to frequent overflow and as the surface is level much of it is covered with water for several days at a time. These overflows usually come in the winter and early spring, but are sometimes seen as late as July. Very little of the soil has ever been cleared, most of it being covered by a valuable growth of white oak, sycamore, gum, hickory, and pecan.

The Wabash clay is an exceptionally strong soil, and if protected from floods would be the most productive in the county. The type is a splendid grass land and is well adapted to the staple crops of the area. If well drained, it would also be suited to alfalfa. At present none of the land is under cultivation, though it furnishes considerable pasturage.

The greatest need of this soil is protection from overflows. This could best be accomplished by straightening and cleaning out the channel of the Sulphur River. While this would entail considerable expense the cost would not be out of proportion to the resulting increased value of the lands. Much improvement in the present condi-

tion could also be cheaply made by deepening some of the numerous bayous which wind through the bottoms.

Although this land is situated 12 to 18 miles from market, it is held as high as any land in the county. Its value ranges from $15 to $30 an acre.

The following table gives the results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Wabash clay.

No.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18343	Soil	0.0	4.4	1.7	7.0	3.8	46.6	37.2
18344	Subsoil	.0	.6	.4	3.6	5.0	37.7	53.2

WILSON LOAM.

The soil of the Wilson loam, about 6 inches in depth, is a heavy, brown loam marked to a slight extent with reddish-yellow. The subsoil is a yellowish-brown clay from 6 inches to 3 or 4 feet deep, below which occurs a stratum of gray, stratified clay many feet in thickness.

On account of the high organic matter content the soil, if in the proper moisture condition, is loose and mellow and cultivation is easy, but if an attempt is made to cultivate the land when wet the compact and sticky soil material adheres to the plow or comes up in great clods, making a satisfactory tilth difficult to secure.

The Wilson loam is of comparatively small extent, the type occurring only in the treeless part of the county. One of the largest bodies is found on the prairie immediately northwest of Mount Vernon, and others to the south of White Oak Creek and in the vicinity of Hagansport.

Except on the level prairie in the vicinity of Mount Vernon the topography is gently rolling. The surface drainage, therefore, is usually good, but on account of the impervious subsoil adequate underdrainage can be had only by the use of artificial drains.

The type is composed of weathered sea deposits and represents a gradual merging of the stratified Cretaceous clays with the lowermost deposits of the Eocene Tertiary. Except for the occasional occurrence of small groves of stunted oaks, the soil in its native state is covered only by a growth of prairie grass. This is one of the heaviest upland soils in the county and when properly cultivated is well adapted to the growing of general farm crops. It is also well suited to various grasses, and it is probable that on the better

drained areas alfalfa would do well. The only cultivated crops grown on the type are cotton and corn, which yield from one-fourth to one-half bale and from 15 to 20 bushels per acre, respectively. Cotton is said to give somewhat better yields than corn, and for this reason a much larger acreage is devoted to it.

Owing to the stiff nature of the subsoil, spring plowing is very shallow, the operation consisting of little more than throwing up the surface soil into ridges. During the summer the land suffers badly from drought. This could be largely overcome by deeper plowing and more frequent summer cultivations. The fertilizer most commonly used is cotton seed, of which about 1,000 pounds per acre is usually applied.

The value of land composed of this type of soil ranges from $7 to $15 an acre.

The following table gives the results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Wilson loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18054	Soil	0.4	1.3	0.4	5.7	9.7	63.6	18.3
18055	Subsoil	.0	1.2	.4	5.2	6.2	61.9	25.3

WILSON CLAY LOAM.

The Wilson clay loam consists of 6 to 8 inches of yellowish-brown to dark-brown loam or clay loam, often containing a large percentage of silt, underlain by a yellowish-brown to black clay. When wet the soil is sticky and plastic, which prevents cultivation for several days after heavy rains. Small areas thickly strewn with waterworn gravel are common throughout the type, and limestone concretions are occasionally found in both soil and subsoil.

The Wilson clay loam is found only in a few small bodies in the northern part of the county, the most typical of which occur in the vicinity of Hagansport and Lavada. Other bodies are found about 3½ miles north of Mount Vernon and in the northeast corner of the county.

The topography is gently rolling and the surface drainage is good. Subdrainage, however, is needed in some cases, especially in the comparatively level area near Mount Vernon.

The type is of marine origin and possesses points in common with both the Houston clay and Wilson loam. No trees are found, the wild

grasses common to all the prairies being the only native vegetation found on this soil. Tame grasses should do well and if the ground is carefully prepared it is probable that alfalfa would succeed. This is especially true of some of the well-drained ridges in the vicinity of Hagansport and Lavada. Unless thoroughly cultivated the soil dries out and suffers from drought during the growing season, and for this reason is somewhat better adapted to cotton than to corn. Excepting about one-half of the body in the vicinity of Lavada which is used for pasturage, nearly all of the Wilson clay loam is under cultivation. Cotton is the chief crop grown, the yield being from one-third to three-fourths bale per acre. The soil is in need of deeper plowing and more frequent summer cultivations, by which means the tendency to suffer from drought may be largely overcome. Land of this soil type may be purchased for $7 to $15 an acre, depending on location, improvements, and state of cultivation.

CADDO FINE SANDY LOAM.

The Caddo fine sandy loam consists of from 6 to 12 inches of gray, or yellowish-gray, fine sand or fine sandy loam, underlain by gray fine silty sand which extends to 30 inches. Below this depth the material is a sticky yellow clay containing varying quantities of sharp fine sand. In areas where drainage is poor the deep subsoil is sometimes a compact or mottled gray and yellow clay. As a rule, the gray color increases with depth, the deep subsoil commonly being a sticky gray clay.

The Caddo fine sandy loam is found chiefly in the central part of the county, the largest and most numerous bodies occurring in the vicinity of Mount Vernon and others from 10 to 40 acres in extent are found farther east. The elevation of most of the type is somewhat lower than that of the adjacent soils and the topography is usually quite level. Because of the low, flat, or depressed surface configuration, the type is for the most part poorly drained.

This soil is of sedimentary origin and represents a sandy covering deposited during the early stages of the Eocene period. In the vicinity of Mount Vernon it was originally heavily wooded with red oak, post oak, and hickory, but in the eastern part of the county the hardwoods were mixed with pine.

On account of the impervious nature of the deep subsoil, the more level areas of the type have a tendency to remain saturated with water during the early spring months. For this reason the soil is somewhat later than the Norfolk fine sand and not quite so well adapted to early truck crops. If properly drained, however, it would be an excellent trucking soil, as its ability to retain moisture would

be a valuable quality during the dry summer months. Sweet potatoes, Irish potatoes, peanuts, cowpeas, and small fruits should do well and should be made to supplant a part of the cotton and corn. Near Mount Vernon peanuts are grown to some extent, the yield averaging about 50 bushels of nuts and from 1 to 2 tons of hay per acre. Corn yields from 12 to 20 bushels per acre, and cotton from one-fourth to one-half bale. The heavier areas are well suited to Bermuda grass and redtop (*Agrostis alba*).

The land is deficient in organic material and a greater effort should be made to correct the deficiency. Fall oats and winter vetch, pastured throughout the winter months and turned under before the planting of the spring crop, would be a decided benefit in this respect.

There is a low-lying area near White Oak Creek, 4½ miles north of Mount Vernon, which consists in part of a gray fine sandy loam or silty loam from 4 to 10 inches deep, underlain by gray or yellow and gray silty clay. In appearance this material resembles the poorly-drained bodies of Lufkin clay mapped in other areas, but they are all exceedingly small in extent. Scattered over the surface of about one-half of this phase of the type are small rounded mounds from 2 to 4 rods across and 3 or 4 feet in height. These mounds sometimes consist of gray fine sand 3 feet or more in depth, and again of yellowish gray fine loamy sand which is underlain at 20 inches with mottled red and gray sandy clay.

During periods of excessive rain the lower portions of this area are sometimes covered with standing water, which gives the rounded mounds the appearance of little islands separated from each other by winding channels from 2 to 4 rods in width. Although this phase occurs in the bottoms of White Oak Creek it is not, strictly speaking, an alluvial soil. Doubtless the lower occurrences have been influenced in their formation by the overflow waters of the creek, but from the appearance of the red clay subsoil on the mounds it is probable that they are more or less sedimentary.

The principal forest growth is post oak, which is now being removed for posts and ties. None of this phase is under cultivation, and until artificial drainage is resorted to it is not probable that cultivated crops would prove successful. On account of the uneven surface of the land it is best adapted to the growing of grasses to be used for pasturage.

The Caddo fine sandy loam is valued at from $4 to $15 an acre.

The following table gives the average results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Caddo fine sandy loam.

No.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18317, 18345, 18347 ..	Soil.....	0.2	0.8	0.3	16.1	34.7	38.5	9.7
18318, 18346, 18348 ..	Subsoil ...	.2	.6	.2	13.1	29.2	34.6	22.2

SANDERS SILT LOAM.

The soil of the Sanders silt loam consists of 8 to 15 inches of a gray silt loam, with an average depth of about 1 foot. When in a dry condition the soil has a fine, flourlike texture, and is almost white in color, but owing to the high clay content it becomes very plastic and sticky when wet. The subsoil is a gray or mottled yellow and gray compact silty clay. Both soil and subsoil are marked with brownish-yellow iron stains which become more pronounced as the depth increases.

Because of its small extent the type is not of great importance in the county. It is found as lowlands in the bottoms of White Oak Creek, Big Creek, and Andys Creek, a tributary of Big Cypress Creek.

The topography of the type is level and because of its low position the areas are subject to overflow at any season of the year. The soil has been formed by the deposition of fine material during times of flood, a process which is still going on.

The forest growth consists of white oak, post oak, gum, and sycamore. Dense bodies of wild cane are also found interspersed with areas of Bermuda grass, which makes the type of value as a pasture for cattle and hogs.

Owing to the poor drainage and the frequent overflows none of the soil is under cultivation, and unless artificially protected from floods it is doubtful if cultivated crops would be found profitable upon it. The soil is well adapted to the production of hay, especially Bermuda grass, redtop, and such grasses as are not injured by flooding. The value of the land ranges from $4 to $7 an acre.

The following table gives the results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Sanders silt loam.

No.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18050	Soil.....	0.4	1.8	0.8	10.8	9.2	58.3	18.6
18051	Subsoil	.2	1.6	.8	8.2	9.8	53.7	25.4

SANDERS CLAY.

The soil of the Sanders clay consists of 6 to 8 inches of a light-gray silty clay. The subsoil to a depth of 3 feet is an ashy-gray, sticky, impervious clay, becoming almost white in color on exposure to the sun. In places both soil and subsoil contain a high percentage of silt and at times a small quantity of very fine sand. When wet the soil is sticky and plastic and the presence of numerous reddish-brown iron stains gives it a slightly mottled appearance, which becomes quite marked in the lower depths.

The soil is notably deficient in organic matter, and if worked when in a wet condition bakes into irregularly shaped bricks, which are slow to break down.

The Sanders clay is the most common lowland soil in the county. The largest bodies are found as strips from 1 to 2 miles wide along the bottoms of White Oak, Cypress, and Brushy creeks. Other irregular bodies are found scattered through the wooded bottoms of Big Creek, Little Cypress, and some of the smaller streams, but the texture is usually quite silty, and as these areas are closely associated with areas of Sanders silt loam they appear on the map with the latter type.

The origin of the type is alluvial, being derived from the materials deposited by the streams in times of overflow. The surface is quite level and most of the soil is flooded several times a year. As the subsoil is close and impervious the removal of the water is slow and as a result the ground is sometimes saturated for weeks. This condition could be much improved by straightening and deepening the numerous bayous which wind through the bottoms. None of the soil is under cultivation, it being covered by a growth of white oak, post oak, and sycamore. Considerable areas are also densely covered by a growth of wild cane, which furnishes a valuable winter feed for cattle.

On account of the frequency with which the land is overflowed the growing of cultivated crops, unless protected from floods, would likely prove unprofitable. In its present condition about the best use to which the land can be put is the growing of Bermuda grass for pasturage. This is a crop which the floods will not ruin, and a field once established will continue to yield luxuriant pasturage for cattle and hogs for many years. On this soil fine yields of Bermuda grass hay could also be secured, a crop which is in demand throughout the county.

In its present wet condition the land is not thought to be very desirable for agricultural purposes, but if artificially drained and protected from floods it should produce the tame grasses as well as the staple crops of the area. The land is valued at $4 to $10 an acre, depending on location and timber growth.

The following table gives the results of mechanical analyses of the soil and subsoil of this type:

Mechanical analyses of Sanders clay.

No.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18052	Soil	0.0	1.2	0.7	3.6	9.0	52.8	32.3
18053	Subsoil	.1	1.4	.7	3.5	13.8	48.7	32.7

MEADOW.

Meadow includes a soil of varying texture and agricultural value. The surface material consists of light-colored silty sand and fine sandy loam, mixed with small areas of gray silt loam and silty clay. The subsoil varies from a gray fine sandy loam to a silty clay loam or clay. Below the second foot the color is frequently marked with reddish-yellow stains due to the presence of iron washed in from adjacent types. Narrow strips of Meadow are found along the smaller streams in all parts of the county, the most important bodies occurring in the vicinity of Mount Vernon and along Panther, Big Cypress, and Brushy creeks.

The type is all level, and most of it is subject to overflow at any season of the year. Only a very small proportion of the type is under cultivation, the remainder being occupied by forests of white oak, post oak, ash, and hickory.

Sugar cane does especially well on this soil, and has proven very profitable. The yield ranges from 250 to 500 gallons of sirup per acre, which sells for from 35 to 50 cents a gallon. The type if drained and protected from overflows would be well adapted to the growing of corn and grasses. Even under present conditions Bermuda grass thrives and furnishes a large area of pasturage. Corn yields from 25 to 40 bushels, and cotton from one-half to 1 bale per acre. In its present condition most of the soil is uncertain for cultivated crops. On many of the sandy bodies along the smaller streams, however, drainage could be easily effected by straightening the streams and constructing lateral ditches, in which case the soil would be one of the most valuable in the county.

The value of this type of land ranges from $3 to $10 an acre, the higher value being due to valuable timber growth.

SUMMARY.

Franklin County is located near the northeast corner of the State, on the line between the east Texas timber belt and the black land region of central Texas. The surface is level to rolling and the drain-

age is good. Mount Vernon and Winnsboro are the chief towns and shipping points, the former being the county seat.

The climate is mild and agreeable. Planting can be done throughout every month of the year, and the growing season is such that the fields can be made to mature two crops before the appearance of killing frosts.

Cotton and corn still continue to be the chief crops grown, although in the vicinity of Winnsboro the peach industry has been widely extended, there having been half a million trees set out during the past three years. More attention should be given to the production of live stock, and more forage crops should be grown. The county has several soils which if properly drained would be suited to the growing of alfalfa. These are the Houston clay, Wabash clay, Sanders clay loam, Wilson clay loam, and Wilson loam.

The soils of the county are rather complex, falling naturally into 9 general series and being again divided into 16 distinct types. These range from the dark heavy clays of the Sulphur River bottoms to the light textured Norfolk sands.

The most extensive soil is the Susquehanna fine sandy loam, which like the Norfolk fine sand is well adapted to fruit, berries, and truck.

The Lufkin fine sandy loam is an extensive type in the northern part of the county and is valued as a range for stock and for the production of wild hay.

The Sanders clay, Sanders silt loam, and Meadow are lowland soils occurring in all parts of the county. On account of the loss from overflows very little of these soils are under cultivation. They are adapted to Bermuda grass, redtop, and, where well drained, to sugar cane.

The Caddo fine sandy loam is a type of wide distribution and is fairly well adapted to fruit and early truck crops.

The Orangeburg sand is of very limited extent, but is one of the best peach soils in the country.

The Lufkin silt loam, Susquehanna clay, Norfolk fine sandy loam, and Lufkin fine sand are all of very small extent and of little agricultural importance.

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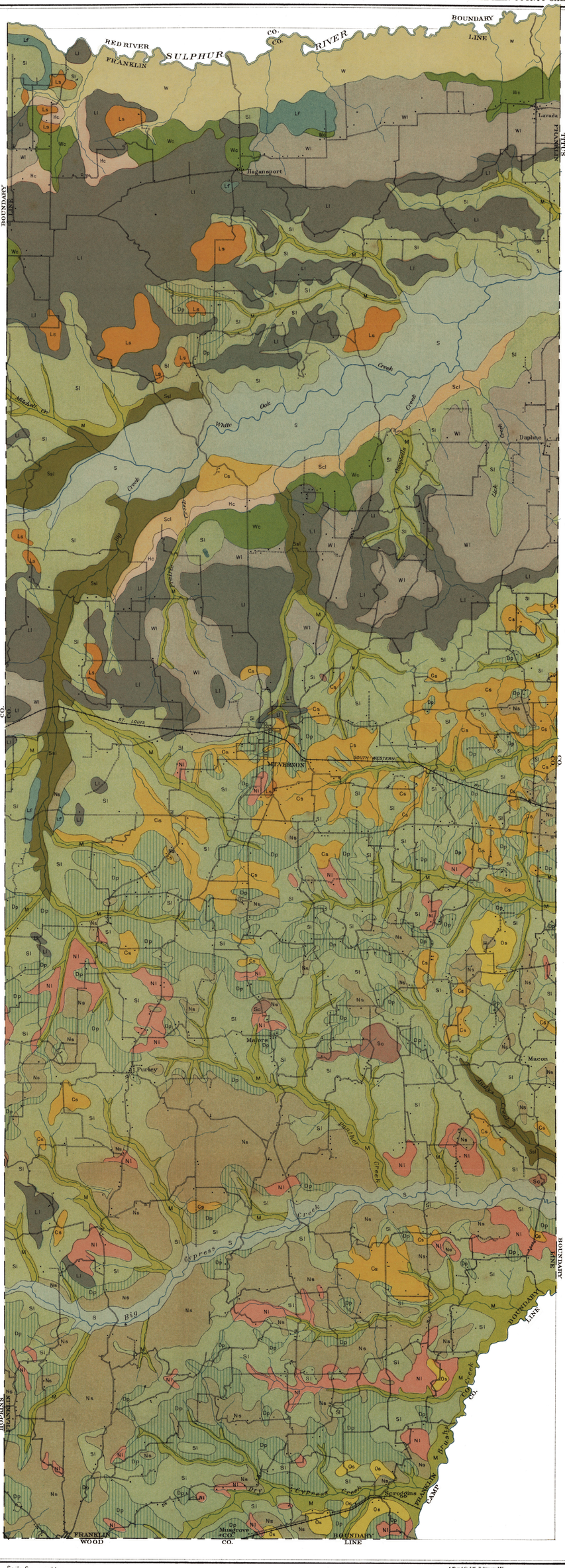
U.S. DEPT. OF AGRICULTURE
BUREAU OF SOILS
MILTON WHITNEY, CHIEF.

SOIL MAP

TEXAS
FRANKLIN COUNTY SHEET.



SOIL PROFILE
(3 feet deep)

- Susquehanna fine sandy loam: Fs, Fsl, C
- Deep phase: Fsl, C
- Susquehanna clay: Fsl, C
- Norfolk fine sand: Fs, Fs
- Norfolk fine sandy loam: Fsl, Sc
- Lufkin fine sand: Fs, Fs, C
- Lufkin fine sandy loam: Fsl, C
- Lufkin silt loam: Sil, Sic
- Wilson loam: L, C
- Wilson clay loam: Cl, C
- Sanders silt loam: Sil, Sic
- Sanders clay loam: Cl, Sic
- Sanders clay: Sic, C
- Caddo fine sandy loam: Fsl, Sis, C
- Houston clay: Cl, C, C
- Wabash clay: C, C
- Orangeburg sand: S, Sc

LEGEND

Fs	Fine sand
Fsl	Fine sandy loam
C	Clay
Sc	Sandy clay
Sil	Silt loam
Sic	Silty clay
Cl	Clay loam
L	Loam
Sis	Silty sand
S	Sand

LEGEND

- Susquehanna fine sandy loam: Si
- Deep phase: Dp
- Susquehanna clay: Sc
- Norfolk fine sand: Ns
- Norfolk fine sandy loam: Nl
- Lufkin fine sand: Lf
- Lufkin fine sandy loam: Ll
- Lufkin silt loam: Ls
- Wilson loam: Wl
- Wilson clay loam: Wc
- Sanders silt loam: Ssl
- Sanders clay loam: Scl
- Sanders clay: S
- Caddo fine sandy loam: Cs
- Houston clay: Hc
- Wabash clay: W
- Orangeburg sand: Os
- Meadow: M

Soils Surveyed by
A.E. Kocher and W.S. Lyman.
1908.

0 1 2 3 4
Scale 1 inch = 1 mile

BASE MAP IN COOPERATION WITH
U.S. GEOLOGICAL SURVEY

A. Hoen & Co. Lith. Baltimore, Md.

Field Operations
Bureau of Soils
1908.